

WHAT IS CLAIMED IS:

1. A semiconductor layer laser annealing method for improving characteristic of a semiconductor layer formed on a substrate by irradiating a laser beam, wherein  
5 an energy level in a region to be irradiated by the laser beam is set such that a level towards the rear of a region along which the laser beam scans is lower than that at the front area or the center area of the region.
- 10 2. A semiconductor layer laser annealing method for obtaining a polycrystal semiconductor layer by irradiating a laser beam on an amorphous semiconductor layer formed on a substrate, wherein  
15 an energy level in a region to be irradiated by the laser beam is set such that a level towards the rear of a region along which the laser beam scans is lower than that at the front area or the center area of the region.
- 20 3. A laser annealing method according to claim 2, wherein the energy level at the front or center of the region is equal to or greater than the upper limit energy level, which thereby maximizes grain size of the semiconductor layer.
- 25 4. A semiconductor layer laser annealing method for obtaining a polycrystal semiconductor layer by irradiation of an amorphous semiconductor layer formed on a substrate with a

energy level at the rear area of the region along the scan direction is lower than the upper limit energy level.

8. A laser annealing method according to claim 4, wherein  
5 the upper limit energy level which maximizes a grain size of the semiconductor layer corresponds to the lower limit energy level over which the polycrystal semiconductor layer is changed into an amorphous state.

10 9. A transistor device in which a polycrystal semiconductor layer is formed by subjecting an amorphous semiconductor layer formed on a substrate to laser anneal processing, wherein  
15 an energy level in a region to be irradiated by a laser beam of the amorphous semiconductor layer is set such that the level in a rear area of a region along a scan direction of the laser beam is lower than the upper limit energy level which maximizes a grain size of the semiconductor layer, and  
the amorphous semiconductor layer is annealed by the laser beam and the polycrystal semiconductor layer obtained is used  
20 as an active layer of the transistor device.

10. A transistor device according to claim 9, wherein  
the transistor device is a thin film transistor, and  
a channel layer of the thin film transistor is formed in  
25 the polycrystal semiconductor layer obtained by the laser anneal processing.

11. A transistor device according to claim 9, wherein  
the transistor device is a thin film transistor,  
a channel layer of the thin film transistor is formed in  
the polycrystal semiconductor layer obtained by the laser  
5 anneal processing, and  
the thin film transistor is used as a switching device  
formed in a display area of a substrate forming a liquid  
crystal display and as a switching device of a driver circuit  
formed surrounding the display area of the substrate through a  
10 process substantially equal to a process of forming the  
switching device of the display region.

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